

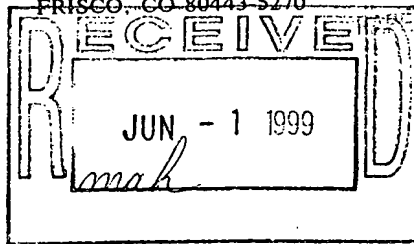
PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To: CARL OPPEDAHL
OPPEDAHL & LARSON
P.O. BOX 5270
FRISCO, CO 80443-5270

REPORTING LETTER
COMPUTER DOCKET
28 July 99
mah



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of Mailing
(day/month/year)

28 MAY 1999

Applicant's or agent's file reference
ASCOP061WO

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/US99/05891

International filing date
(day/month/year)
18 MARCH 1999

Applicant
ASCOM HASLER MAILING SYSTEM INC.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

EDWARD R COSIMANO

Telephone No. (703) 308-3800

E. R. Cosimano

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference ASCOPO61WO	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US99/05891	International filing date (day/month/year) 18 MARCH 1999	(Earliest) Priority Date (day/month/year) 18 MARCH 1998
Applicant ASCOM HASLER MAILING SYSTEM INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).

2. ☐ Unity of invention is lacking (See Box II).

3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

☐ filed with the international application.

☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ transcribed by this Authority.

4. With regard to the title, ☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:

Figure No. 1

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT

In accordance with the invention, a postal security device (PSD) (10) contains a non-volatile memory (13) which does not depend on battery power such as an EEPROM (13), and contains a nonvolatile memory (14,16) which does depend on battery power, such as a static RAM. The PSD (10) also contains an encryption engine (12,14,22). An encryption key is developed and is stored in the static RAM (14), which is sized to be only large enough to contain the encryption key. A large body of data, too large to fit in the static RAM, is encrypted by means of the encryption engine (12,14,22) and with reference to the encryption key, and is stored in the EEPROM (13). This body of data typically includes cryptographic keys and sensitive bit-images. When the PSD is powered, a large RAM (typically a dynamic RAM) (16) is available to receive the large body of data, decrypted using the encryption key. A tamper switch (17) cuts power to both RAMs (14,16) in the event of tampering.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/05891

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G07B 17/04

US CL : 705/405

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 380/3, 4, 23, 25; 705/401, 405, 410

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

None

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,575,621 A (DREIFUS) 11 March 1986, see abstract.	1-3
A	US 4,882,752 A (LINDMAN et al) 21 November 1989, see abstract.	1-3
A	US 5,097,253 A (ESCHBACH et al 17 March 1992, see abstract.	1-3
A	US 5,249,227 A (BERGUM et al) 28 September 1993, see abstract.	1-3

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

15 MAY 1999

Date of mailing of the international search report

28 MAY 1999

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

EDWARD R COSIMANO

Telephone No. (703) 308-3800

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: MARINA T. LARSON
OPPEDAHL & LARSON LLP
P.O. BOX 5270
FRISCO, CO 80443-5270

PCT

FEB 14 2000

WRITTEN OPINION

(PCT Rule 66)

Date of Mailing
(day/month/year)

09 FEB 2000

Applicant's or agent's file reference

ASCOPO61WO

REPLY DUE

within TWO months
from the above date of mailing

International application No.

PCT/US99/05891

International filing date (day/month/year)

18 MARCH 1999

Priority date (day/month/year)

18 MARCH 1998

International Patent Classification (IPC) or both national classification and IPC
IPC(6): G07B 17/04 and US Cl.: 705/405

Applicant

ASCOM HASLER MAILING SYSTEMS INC.

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

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PAPER DOCKET 4/9/00

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 18 JULY 2000

Name and mailing address of the IPEA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

EDWARD R COSIMANO

Telephone No. (703) 308-9783

I. Basis of the opinion

1. This opinion has been drawn on the basis of *(Substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed")*:

☒ the international application as originally filed.

☒ the description, pages 1-7, as originally filed.

pages NONE, filed with the demand.

pages NONE, filed with the letter of _____.

☒ the claims, Nos. 1-3, as originally filed.

Nos. NONE, as amended under Article 19.

Nos. NONE, filed with the demand.

Nos. NONE, filed with the letter of _____.

☒ the drawings, sheets/fig 1-1, as originally filed.

sheets/fig NONE, filed with the demand.

sheets/fig NONE, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☒ the description, pages none

☒ the claims, Nos. none

☒ the drawings, sheets/fig none

3. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the ~~Supplemental Box~~ Additional observations below (Rule 70.2(c)).

4. Additional observations, if necessary:

NONE

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. STATEMENT**

Novelty (N)

Claims 1-3 YESClaims none NO

Inventive Step (IS)

Claims 1-3 YESClaims none NO

Industrial Applicability (IA)

Claims 1-3 YESClaims none NO**2. CITATIONS AND EXPLANATIONS**

1. Claims 1-3 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the removal of power from a PSD so as to delete the encryption key from the PSD if tampering with the PSD has been detected.

----- NEW CITATIONS -----

NONE

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

1. The drawings are objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or content thereof:
 - ✓ 1.1 The drawings lack an explicit encryption engine, claims 1-3, although devices 12, 14 & 22 may act as an encryption engine.
- ✓ 2. The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof:
 - ✓ 2.1 The disclosure lacks an explicit reference to the feature of the invention designated as 11 in fig. 1.
 - ✓ 2.2 A statement of --I Claim:-- is lacking.

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claims 2 & 3 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claims 2 & 3 are indefinite for the following reason(s):

- 1.1 In claims 2 & 3, it is unclear how it is determined if tampering has occurred, since a tampering event has not been detected within these claims.

WRITTEN OPINION

International application No.

PCT/US99/05891

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 13 JUL 2000

Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US99/05891	International filing date (day/month/year) 18 MARCH 1999	Priority date (day/month/year) 18 MARCH 1998
International Patent Classification (IPC) or national classification and IPC IPC(7): G07B 17/04 and US Cl.: 705/405		
Applicant ASCOM HASLER MAILING SYSTEMS INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>4</u> sheets. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of <u>3</u> sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step or industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 16 JULY 1999	Date of completion of this report 04 JUNE 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer <i>For Eugenio Zagan</i> EDWARD R COSIMANO Telephone No. (703) 308-9783

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/05891

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed☒ the description:

pages (See Attached) _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the claims:

pages (See Attached) _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the drawings:

pages (See Attached) _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☒ the sequence listing part of the description:

pages (See Attached) _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☒ The amendments have resulted in the cancellation of:☒ the description, pages _____ None☒ the claims, Nos. _____ None☒ the drawings, sheets/fig _____ None5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

**Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT -

International application No.

PCT/US99/05891

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)

Claims	<u>1-3</u>	YES
Claims	<u>None</u>	NO

Inventive Step (IS)

Claims	<u>1-3</u>	YES
Claims	<u>None</u>	NO

Industrial Applicability (IA)

Claims	<u>1-3</u>	YES
Claims	<u>None</u>	NO

2. citations and explanations (Rule 70.7)

1. Claims 1-3 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the removal of power from a PSD so as to delete the encryption key from the PSD if tampering with the PSD has been detected.

----- NEW CITATIONS -----
NONE

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

I. BASIS OF REPORT:

This report has been drawn on the basis of the description,
page(s) 1-3 & 5-7, as originally filed.
page(s) None, filed with the demand.
and additional amendments:
Page 4, filed with the letter of 29 March 2000.

This report has been drawn on the basis of the claims,
page(s) None, as originally filed.
page(s) None, as amended under Article 19.
page(s) None, filed with the demand.
and additional amendments:
Pages 8 & 9, filed with the letter of 29 March 2000.

This report has been drawn on the basis of the drawings,
page(s) 1, as originally filed.
page(s) None, filed with the demand.
and additional amendments:
None

This report has been drawn on the basis of the sequence listing part of the description:
page(s) NONE, as originally filed.
pages(s) NONE, filed with the demand.
and additional amendments:
NONE

IP/US 29 MAR 2000

It would thus be desirable to have a PSD design which protects the many important items of data stored within, and yet which does not draw very much battery power and so permits a commercially acceptable battery life.

Summary of the invention

5 In accordance with the invention, a postal security device (PSD) contains a nonvolatile memory which does not depend on battery power, such as an EEPROM, and contains a nonvolatile memory which does depend on battery power, such as a static RAM. The PSD also contains an encryption engine. An encryption key is developed and is stored in the static RAM, which is sized to be only large enough to contain the encryption key. A large body of data, too large to fit in the
10 static RAM, is encrypted by means of the encryption engine and with reference to the encryption key, and is stored in the EEPROM. This body of data typically includes cryptographic keys and sensitive bit-images. When the PSD is powered, a large RAM (typically a dynamic RAM) is available to receive the large body of data, decrypted using the encryption key. A tamper switch cuts power to both RAMs in the event of tampering. In this way, the battery power required to
15 maintain the PSD during power-off periods is minimal, and yet the large body of data will be inaccessible in the event of tampering.

Description of the drawing

The invention will be described with respect to a drawing, of which:

Fig. 1 is a schematic functional block diagram of a system according to the invention.

20

Detailed description

Fig. 1 shows a postal security device (PSD) in accordance with the invention. The PSD has a secure housing 11, a microprocessor 12 which communicates on a bus 23 with an input/output (I/O) device 18, a memory which does not require battery backup 13 which may be for example an EEPROM or

I Claim:

1. A postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print data relying in part
5 on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type requiring electrical power to maintain the contents thereof, said postal security device also
10 comprising a battery powering the second memory and a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory is disconnected from the battery, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine, said body of data encrypted by the cryptographic engine with respect to the encryption key.

15 2. A method for use with a postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not
20 requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type that requires electric power to maintain its contents, said postal security device also comprising a battery powering the second memory and a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the
25 second memory is disconnected from the battery, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine; the method comprising the steps of:

IPEA/US 29 MAR 2000

storing the encryption key within the second memory;

encrypting the body of data by the cryptographic engine with respect to the encryption key;

storing the encrypted body of data in the first memory,

5 determining if tampering has occurred; and

in the event of tampering, removing power from the second memory.

3. A method for use with a postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print
10 data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type that clears its contents upon a predetermined electrical condition,
15 said postal security device also comprising a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory has said predetermined electrical condition, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine; the method comprising the steps of:

20 storing the encryption key within the second memory;
encrypting the body of data by the cryptographic engine with respect to the encryption key;
storing the encrypted body of data in the first memory,
determining if tampering has occurred; and
in the event of tampering, causing said predetermined electrical condition.

PATENT COOPERATION TREATY

PCT

INFORMATION CONCERNING ELECTED
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

To:

OPPEDAHL, Carl
Oppedahl & Larson LLP
P.O. Box 5270
Frisco, CO 80443-5270
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 27 January 2000 (27.01.00)		
Applicant's or agent's file reference ASCOP061WO		IMPORTANT INFORMATION
International application No. PCT/US99/05891	International filing date (day/month/year) 18 March 1999 (18.03.99)	
Priority date (day/month/year) 18 March 1998 (18.03.98)		
Applicant ASCOM HASLER MAILING SYSTEMS INC. et al		

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

National : CA, JP, US

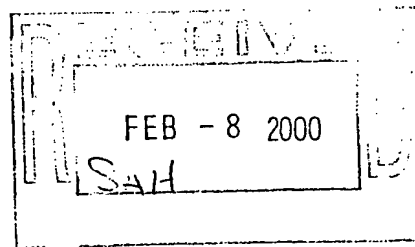
2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

None

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.



The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

Diana Nissen

Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

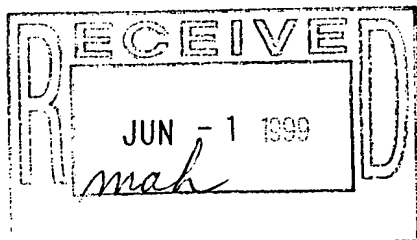
To:

OPPEDAHL, Carl
Oppedahl & Larson
P.O. Box 5270
Frisco, CO 80443-5270
ÉTATS-UNIS D'AMÉRIQUE


Date of mailing (day/month/year) 12 May 1999 (12.05.99)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference ASCOPO61WO	
International application No. PCT/US99/05891	International filing date (day/month/year) 18 March 1999 (18.03.99)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 18 March 1998 (18.03.98)
Applicant ASCOM HASLER MAILING SYSTEMS INC. et al	

- The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
- This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
- An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
- The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
18 Marc 1998 (18.03.98)	60/078,489	US	21 Apr 1999 (21.04.99)



REPORTING LETTER _____
COMPUTER DOCKET _____
PAPER DOCKET _____

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. (41-22) 740.14.35</p>	<p>Authorized officer</p> <p>Marc Salzman </p> <p>Telephone No. (41-22) 338.83.38</p>
---	--

PATENT COOPERATION T

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

CARL OPPEDAH
OPPEDAHL & LARSON
P.O. BOX 5270
FRISCO CO 80443-5270

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rule 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

Date of mailing
(day/month/year)

13 JAN 2000

Applicant's or agent's file reference
ASCOP061W0

IMPORTANT NOTIFICATION

International application No.
PCT/US99/05891

International filing date (day/month/year)
18 MAR 99

Priority date (day/month/year)
18 MAR 98

Applicant

ASCOM HASLER MAILING SYSTEMS INC.

1. The applicant is hereby **notified** that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

16 JUL 1999

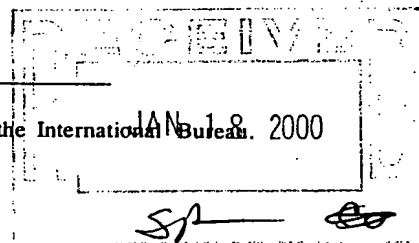
2. That date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- ☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- ☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☐ **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

- ☐ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau. 2000



Name and mailing address of the IPEA/US
Assistant Commissioner for Patents
Box PCT
Washington, D.C. 20231
Facsimile No.

Attn: IPEA/US

Authorized officer

Telephone No.

Shirley Bringle
703-305-3674

Form PCT/IPEA/402 (July 1998)

COMPUTER DOCKET MTK

PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

OPPEDAHL, Carl
Oppedahl & Larson
P.O. Box 5270
Frisco, CO 80443-5270
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 23 September 1999 (23.09.99)		IMPORTANT NOTICE	
Applicant's or agent's file reference ASCOP061WO			
International application No. PCT/US99/05891	International filing date (day/month/year) 18 March 1999 (18.03.99)	Priority date (day/month/year) 18 March 1998 (18.03.98)	
Applicant ASCOM HASLER MAILING SYSTEMS INC. et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
EP,JP,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
CA

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
23 September 1999 (23.09.99) under No. WO 99/48055

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

REPORTING

COMPUTER DOCKET

PAPER DOCKET

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
--	---

The demand must be filed directly with the competent International Preliminary Examining Authority. If two or more Authorities are competent, with the one chosen by the applicant. Full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ US

PCT

CHAPTER II

DEMAND

EL362857180US

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference	
International application No. PCT/US99/05891	International filing date (day/month/year) 18/03/1999	(Earliest) Priority date (day/month/year) 18/03/1999	
Title of invention TAMPER RESISTANT POSTAL SECURITY DEVICE WITH LONG BATTERY LIFE			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) ASCOM HASLER MAILING SYSTEMS INC. 19 FOREST PARKWAY SHELTON, CT 06484-6140 UNITED STATES OF AMERICA		Telephone No.: (203) 925-2418	
		Facsimile No.: (203) 926-0203	
		Teleprinter No.:	
State (that is, country) of nationality: US		State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) NACLERIO, Edward J. 49 Scenic Road Madison, CT 06443 UNITED STATES OF AMERICA			
State (that is, country) of nationality: US		State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.			

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: (Family name followed by given name; for a legal entity, full official designation.
The address must include postal code and name of country.)LARSON, Marina T. and OPPEDAHN, Carl
OPPEDAHL & LARSON LLP
PO BOX 5270
FRISCO, CO 80443-5270

Telephone No.:

(970) 668-2050

Facsimile No.:

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☐ as originally filed☐ as amended under Article 34the claims ☐ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (This check-box may be marked only where the time limit under Article 19 has not yet expired.)

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: ENGLISH☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT)

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (<i>specify</i>) | : | sheets |

For International Preliminary
Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Carl Oppedahl
Carl Oppedahl, agent

~~MARINA T. LARSON, Ph.D.~~

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PCT

FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; padding: 5px;">International application No. PCT/US99/05891</td><td style="width: 50%; padding: 5px;">For International Preliminary Examining Authority use only</td></tr><tr><td style="padding: 5px;">Applicant's or agent's file reference ASCOP061WO</td><td style="padding: 5px;">Date stamp of the IPEA</td></tr></table>	International application No. PCT/US99/05891	For International Preliminary Examining Authority use only	Applicant's or agent's file reference ASCOP061WO	Date stamp of the IPEA					
International application No. PCT/US99/05891	For International Preliminary Examining Authority use only								
Applicant's or agent's file reference ASCOP061WO	Date stamp of the IPEA								
Applicant ASCOM HASLER MAILING SYSTEMS INC.									
Calculation of prescribed fees 1. Preliminary examination fee <div style="display: inline-block; border: 1px solid black; padding: 5px; text-align: center; width: 150px;">490</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin-left: 5px;">P</div> 2. Handling fee (<i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i>) <div style="display: inline-block; border: 1px solid black; padding: 5px; text-align: center; width: 150px;">162</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin-left: 5px;">H</div> 3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box <div style="display: inline-block; border: 1px solid black; padding: 5px; text-align: center; width: 150px;">652</div> <div style="display: inline-block; border: 1px solid black; padding: 2px 5px; margin-left: 5px;">TOTAL</div>									
Mode of Payment <table style="width: 100%;"><tr><td><input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)</td><td><input type="checkbox"/> cash</td></tr><tr><td><input checked="" type="checkbox"/> cheque</td><td><input type="checkbox"/> revenue stamps</td></tr><tr><td><input type="checkbox"/> postal money order</td><td><input type="checkbox"/> coupons</td></tr><tr><td><input type="checkbox"/> bank draft</td><td><input type="checkbox"/> other (specify):</td></tr></table>		<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash	<input checked="" type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps	<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons	<input type="checkbox"/> bank draft	<input type="checkbox"/> other (specify):
<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash								
<input checked="" type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps								
<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons								
<input type="checkbox"/> bank draft	<input type="checkbox"/> other (specify):								
Deposit Account Authorization (<i>this mode of payment may not be available at all IPEAs</i>) The IPEA/ <u>US</u> <input type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account. <input checked="" type="checkbox"/> (<i>this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit</i>) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.									
15-0610 Deposit Account Number	16 July 99 Date (day/month/year)								
Carl Oppen Signature									

BEFORE THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Applicant: ASCOM HASLER MAILING SYSTEMS INC.
Serial No.: PCT/US99/05891
Filed: March 18, 1999
For: Tamper Resistant Postal Security Device with Long Battery Life

RESPONSE TO WRITTEN OPINION

This is in response to the Written Opinion mailed February 9, 2000 for the above-captioned application. Reconsideration of the application and claims in view of the remarks herein is respectfully requested. Three (3) pages of replacement sheets are enclosed. On replacement page 4, a reference to the secure housing shown as reference number 11 in Fig. 1 has been added. Support for this amendment is found on page 1, lines 24-26. Replacement sheet 8 contains the added language "I Claim" suggested by the examiner. Replacement sheet 9 contains amendments to claims 2 and 3.

Paragraph VII of the Written Opinion identifies certain defects in the international application. The drawings were objected to for lacking an explicit encryption engine, although devices 12, 14 and 22 were stated as possibly acting as an encryption engine. Page 5, lines 25-27 recite that "encryption is performed by the processor 12 executing encryption software in the ROM 22, or may optionally be performed by an encryption engine omitted for clarity in Fig. 1." Applicants respectfully submit that Fig. 1 does contain an explicit encryption engine in device 12.

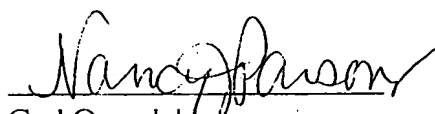
The description is objected to as lacking an explicit reference to the feature of the invention designated as 11 in Fig. 1. Page 4 of the description has been amended to refer to reference number 11 in Fig. 1 as a secure housing. The Background section of the description contains many references to secure housings as conventional parts of a postal

security device (see page 1, line 25; page 3, lines 4, 13 and 15). Applicants respectfully submit that the amendment to page 4 does not include new matter.

The disclosure was objected to for lacking a statement of - -I Claim- -. This statement has been added to page 8.

Paragraph VIII of the Written Opinion identifies claims 2 and 3 as lacking clarity under PCT Article 6 because it is unclear how it is determined if tampering has occurred, since a tampering event has not been detected within the claims. Claims 2 and 3 have been amended to include the step of "determining if tampering has occurred". Support for this amendment is found in the description on page 3, lines 4-18. Applicants submit that the scope of these claims, as amended, is not unclear and meets the requirements of PCT Article 6.

Respectfully submitted,



Carl Oppedahl
PTO Reg. No. 32,746
(970) 668-2050

Nancy J. Parsons
PTO Reg. No. 40,364
(970) 668-2050

It would thus be desirable to have a PSD design which protects the many important items of data stored within, and yet which does not draw very much battery power and so permits a commercially acceptable battery life.

Summary of the invention

5 In accordance with the invention, a postal security device (PSD) contains a nonvolatile memory which does not depend on battery power, such as an EEPROM, and contains a nonvolatile memory which does depend on battery power, such as a static RAM. The PSD also contains an encryption engine. An encryption key is developed and is stored in the static RAM, which is sized to be only large enough to contain the encryption key. A large body of data, too large to fit in the
10 static RAM, is encrypted by means of the encryption engine and with reference to the encryption key, and is stored in the EEPROM. This body of data typically includes cryptographic keys and sensitive bit-images. When the PSD is powered, a large RAM (typically a dynamic RAM) is available to receive the large body of data, decrypted using the encryption key. A tamper switch cuts power to both RAMs in the event of tampering. In this way, the battery power required to
15 maintain the PSD during power-off periods is minimal, and yet the large body of data will be inaccessible in the event of tampering.

Description of the drawing

The invention will be described with respect to a drawing, of which:

Fig. 1 is a schematic functional block diagram of a system according to the invention.

20 Detailed description

Fig. 1 shows a postal security device (PSD) in accordance with the invention. The PSD has a secure housing 11, a microprocessor 12 which communicates on a bus 23 with an input/output (I/O) device 18, a memory which does not require battery backup 13 which may be for example an EEPROM or

I Claim:

1. A postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type requiring electrical power to maintain the contents thereof, said postal security device also comprising a battery powering the second memory and a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory is disconnected from the battery, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine, said body of data encrypted by the cryptographic engine with respect to the encryption key.
2. A method for use with a postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type that requires electric power to maintain its contents, said postal security device also comprising a battery powering the second memory and a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory is disconnected from the battery, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine; the method comprising the steps of:

storing the encryption key within the second memory;

encrypting the body of data by the cryptographic engine with respect to the encryption key;

storing the encrypted body of data in the first memory,

5 determining if tampering has occurred; and

in the event of tampering, removing power from the second memory.

3. A method for use with a postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print
10 data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type that clears its contents upon a predetermined electrical condition,
15 said postal security device also comprising a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory has said predetermined electrical condition, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine; the method comprising the steps of:

20 storing the encryption key within the second memory;

encrypting the body of data by the cryptographic engine with respect to the encryption key;

storing the encrypted body of data in the first memory,

determining if tampering has occurred; and

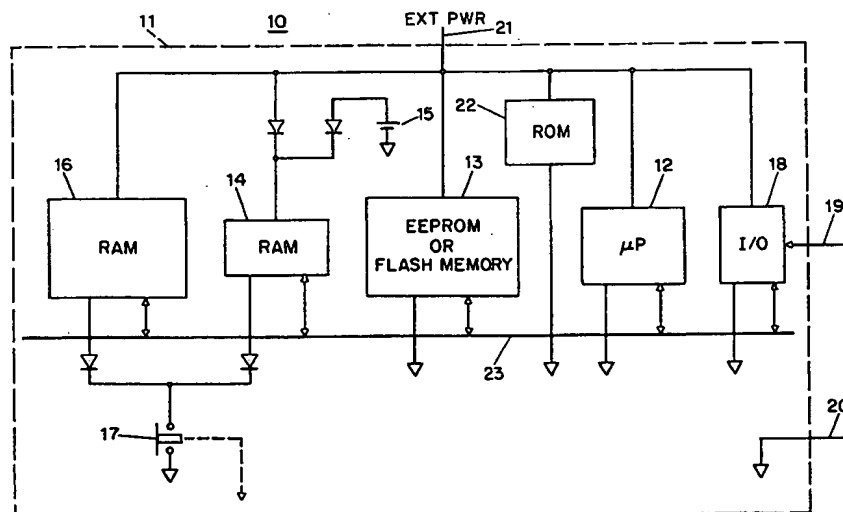
in the event of tampering, causing said predetermined electrical condition.



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G07B 17/04	A1	(11) International Publication Number: WO 99/48055 (43) International Publication Date: 23 September 1999 (23.09.99)
(21) International Application Number: PCT/US99/05891 (22) International Filing Date: 18 March 1999 (18.03.99) (30) Priority Data: 60/078,489 18 March 1998 (18.03.98) US (71) Applicant (for all designated States except US): ASCOM HASLER MAILING SYSTEMS INC. [US/US]; 19 Forest Parkway, Shelton, CT 06484-6140 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): NACLERIO, Edward, J. [US/US]; 49 Scenic Road, Madison, CT 06443 (US). (74) Agents: OPPEDAHN, Carl et al.; Oppedahl & Larson, P.O. Box 5270, Frisco, CO 80443-5270 (US).	(81) Designated States: CA, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>	

(54) Title: TAMPER RESISTANT POSTAL SECURITY DEVICE WITH LONG BATTERY LIFE



(57) Abstract

In accordance with the invention, a postal security device (PSD) (10) contains a non-volatile memory (13) which does not depend on battery power such as an EEPROM (13), and contains a nonvolatile memory (14, 16) which does depend on battery power, such as a static RAM. The PSD (10) also contains an encryption engine (12, 14, 22). An encryption key is developed and is stored in the static RAM (14), which is sized to be only large enough to contain the encryption key. A large body of data, too large to fit in the static RAM, is encrypted by means of the encryption engine (12, 14, 22) and with reference to the encryption key, and is stored in the EEPROM (13). This body of data typically includes cryptographic keys and sensitive bit-images. When the PSD is powered, a large RAM (typically a dynamic RAM) (16) is available to receive the large body of data, decrypted using the encryption key. A tamper switch (17) cuts power to both RAMs (14, 16) in the event of tampering.

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TAMPER RESISTANT POSTAL SECURITY DEVICE WITH LONG BATTERY LIFE

The invention relates generally to postage meters (franking machines), and relates particularly to systems in which postage value is stored in a postal security device (PSD) so as to be protected against undetected tampering. The application claims priority from US application no. 60/078,489, filed March 18, 1998, which application is incorporated herein by reference to the extent permitted by the designated and elected States hereto.

Background

In recent years it has been proposed to print postal indicia by means of conventional nonsecure printers such as laser printers, ink-jet printers, and thermal transfer printers. Such printers are termed "nonsecure" because the printer itself is not in a secure housing and because the communications channel linking the printer to other apparatus is nonsecure. Under such a proposal, the question naturally arises what would prevent a user from printing the same postal indicium repeatedly, thereby printing postal indicia for which no money has been paid to the post office. The proposed anti-fraud measure is to store information within the indicia which would permit detecting fraud. The indicium would include not only human-readable text such as a date and a postage amount, but would also include machine-readable information, for example by means of a two-dimensional bar code. The machine-readable information would be cryptographically signed, and would include within it some information intended to make fraud more difficult. The information would typically include an identification of the postage meter license (granted by the meter manufacturer or by the postal authorities, depending on the country), an indication of the number of mail pieces franked, the postage amount, a postal security device identifier about which more will be said later, the date and time, and a zip code or post code of the mail piece addressee.

The typical apparatus for printing such "encrypted indicia" postage includes what is called a postal security device or PSD. The PSD has a secure housing, and within the secure housing are the accounting registers as well as a cryptographic engine. The engine permits cryptographic authentication and signing for communication with an external device such as

the computer of the meter manufacturer or of the post office. The engine also permits creation of postal indicia which contain specified information and which are cryptographically signed. The PSD may well be physically small as compared to traditional postage meters. The PSD may be the size of a PCMCIA card or the size of a smart card.

5 Within the PSD the memory must be protected against inadvertent damage due to malfunction of the processor of the PSD, for example as set forth in US Pat. No. 5668973, *Protection system for critical memory information* owned by the same assignee as the assignee of the present application. The PSD must handle power failure in a graceful fashion, for example as set forth in US Pat. No. 5712542, *Postage meter with improved handling of*
10 *power failure*, also owned by the same assignee as the assignee of the present application.

To reduce smudging, the printer may preferably be that described in PCT publication no. 97-46389, *Printing apparatus*, also owned by the same assignee as the assignee of the present application. While it has been proposed that the PSD contain a real-time clock which is keeping time continuously, desirably this requirement may be avoided as described in PCT
15 publication no. 98-08325, *Printing postage with cryptographic clocking security*, also owned by the same assignee as the assignee of the present application. PSDs can form part of a network with multiple printers as described in PCT publication no. 98-13790, *Proof of postage digital franking*, also owned by the same assignee as the assignee of the present application.

20 The postal authorities face the question how the PSD can be protected from tampering. For example, the entire system of PSDs depends on the use of cryptographic keys. The keys are used for authenticating communications between the PSD and the manufacturer's system or the postal authority's system. Such communications are used to set up and maintain the PSDs, and are used to refill or "reset" the PSDs to reflect the ability to print more postage.

25 The keys are also used to cryptographically "sign" information printed in the postal indicia. If the cryptographic keys were compromised, a user might be able to defraud the post office or the PSD manufacturer or both.

Many approaches have been proposed for protection of such cryptographic keys from compromise. The usual approach is to place the cryptographic keys in a RAM (random access memory) of a type which keeps its contents only so long as the RAM receives power from a battery. The secure housing of the PSD is designed to include a tamper switch, so that if the secure housing is tampered with, the switch opens. The switch interrupts power to the RAM (and, in particular, interrupts battery power to the RAM) and its contents are lost. In this way the information in the RAM (for example, the cryptographic keys) is protected from tampering. Another proposed approach is to employ commercial memory chips (such as the Dallas Semiconductor DS1283 and Benchmarq bq3283) offer a pin on the package which will clear the memory based on a predetermined input voltage level. The tamper switch is set up to apply the predetermined voltage upon detection of tampering.

Many approaches have also been proposed for detection of the tampering. In EP 820 041, for example, it is suggested that the secure housing of an old-style mechanical or electromechanical postage meter be set up to contain an air pressure that is distinctively higher than or lower than normal atmospheric pressure. If the secure housing is violated, the pressure within the secure housing changes to match the ambient pressure. A sensor within the housing detects the pressure change and thus the violation. The sensor disables further function of the postage meter.

The approach of cutting power to a volatile memory such as the RAM discussed above has a drawback in that during periods of power-down, the RAM depends on an internal battery to avoid loss of the information in the RAM. Depending on the requirements of the postal authority, and on design decisions made by the PSD manufacturer, the quantity of data requiring protection may be quite large. The data to be protected may include cryptographic keys used for PSD configuration, keys used for remote resetting (refilling), keys used for signing postal indicia, and keys used for the management of the other keys. In addition it may be desired to protect the bit-images used to generate the human-readable portion of the printed indicia. A RAM big enough to hold all of these important items of data will also draw a non-negligible current from the internal battery. This may lead to a limited and commercially unacceptable battery life.

It would thus be desirable to have a PSD design which protects the many important items of data stored within, and yet which does not draw very much battery power and so permits a commercially acceptable battery life.

Summary of the invention

5 In accordance with the invention, a postal security device (PSD) contains a nonvolatile memory which does not depend on battery power, such as an EEPROM, and contains a nonvolatile memory which does depend on battery power, such as a static RAM. The PSD also contains an encryption engine. An encryption key is developed and is stored in the static RAM, which is sized to be only large enough to contain the encryption key. A large body of
10 data, too large to fit in the static RAM, is encrypted by means of the encryption engine and with reference to the encryption key, and is stored in the EEPROM. This body of data typically includes cryptographic keys and sensitive bit-images. When the PSD is powered, a large RAM (typically a dynamic RAM) is available to receive the large body of data, decrypted using the encryption key. A tamper switch cuts power to both RAMs in the event
15 of tampering. In this way, the battery power required to maintain the PSD during power-off periods is minimal, and yet the large body of data will be inaccessible in the event of tampering.

Description of the drawing

The invention will be described with respect to a drawing, of which:

20 Fig. 1 is a schematic functional block diagram of a system according to the invention.

Detailed description

Fig. 1 shows a postal security device (PSD) in accordance with the invention. The PSD has a microprocessor 12 which communicates on a bus 22 with an input/output (I/O) device 18, a memory which does not require battery backup 13 which may be for example an EEPROM or

flash memory, a relatively small RAM 14, a ROM 22, and a larger RAM 16. The I/O device 18 communicates with external apparatus by means of communications channel 19 which may be a serial asynchronous data line. External power 21 and ground 20 are also defined. The larger RAM 16, and most of the other active components, receive external power. The smaller RAM 14 is additionally able to receive power from a backup battery 15, preferably a lithium cell with a very long (e.g. ten year) life. A tamper switch 17 is provided which, when triggered, can cut power to both the small RAM 14 and the large RAM 16.

A large body of data is assumed to require protection from a tampering user. The EEPROM is selected to be large enough to hold this body of data after it has been encrypted. When power is applied and the system is stable, the body of data (or selected portions thereof) is decrypted and transferred to RAM 16. This decryption is performed by the microprocessor 12 executing a decryption routine stored in the ROM 22, and the decryption is done with respect to a decryption key in the RAM 14. Alternatively the decryption may be performed by an optional engine omitted for clarity in Fig. 1. The decrypted data in RAM 16 are used as needed for the ordinary functions of the PSD, which include communicating via the communications channel 19 with a user computer, with a manufacturer's system, or with a postal authority system, and can include generating postal indicia which are to be printed by means of a printer.

When external power 21 is cut off, or when the PSD undergoes a normal power-down routine, the information in the RAM 16 is lost. In contrast, the information in the RAM 14 is preserved even when external power 21 is lost, because of battery 15.

During normal operation the body of data that requires protection from a tampering user (or some portion of it) may be located "in the clear", that is, unencrypted, in the RAM 16. In the event that this data has changed, it may be necessary to encrypt the data and to store it again in the memory 13. This encryption is performed by the processor 12 executing encryption software in the ROM 22, or may optionally be performed by an encryption engine omitted for clarity in Fig. 1.

5 The power-down condition for the PSD 10 assumes that no power is present at line 21. In that event, the only powered device is RAM 14. RAM 14 was purposefully selected to be large enough to hold the encryption key but not much larger, and in any event is smaller than the large body of data that is understood to require protection from a tampering user. Because of the limited size of the RAM 14, it does not draw as much current from the battery 15 as would be drawn by a larger RAM such as RAM 16. Thus, the battery life is optimized, especially as compared with the shorter battery life that would result if the large body of data were all in battery-backed-up RAM.

10 Tampering may happen during a time when external power 21 is present. At a minimum, the tamper switch should cut power to the RAM 14. (Or, alternatively, the tamper switch should apply to RAM 14 the predetermined voltage that clears the RAM.) Preferably the tamper switch will also cut power to the RAM 16 (or clear the RAM 16), for the reason that some of the body of sensitive data may be present "in the clear" in the RAM 16, and should not fall into the hands of the tampering user. Alternatively the tamper switch might trigger an interrupt in the processor 12 which would cause the processor 12 to clear the sensitive portions of the RAM 16.

15 Tampering may also happen during a time when external power 21 is absent. In such a case, the RAM 16 is already, by definition, empty, as it is unpowered. The tamper switch causes the RAM 14 to be cleared. If the tampering user extracts the contents of the memory 13, this is of little significance, because the contents are useless unless decrypted with the assistance of the key that is no longer present in the RAM 14. If the PSD 10 is powered up again after the tampering, the decryption routine will not work because the key of RAM 14 is gone. In addition, desirably the processor 12, under program control, will note the fact that RAM 14 is empty and will immediately attempt to send a message via communications channel 19 to the manufacturer or to the postal authority.

20 Those skilled in the art will readily appreciate that design considerations may prompt the use of electrical components in addition to or instead of those shown in Fig. 1, none of which depart in any way from the invention. For example, dedicated cryptographic chips may be

employed which take some of the computational burden from the microprocessor. As another example, the particular way in which the tamper switch cuts power to the RAM may be varied, and the particular type of tamper switch may be selected among several types, all without departing in any way from the invention. Those skilled in the art will indeed have no
5 difficulty devising obvious variations and improvements to the invention, all of which are intended to be encompassed by the claims that follow.

Claims

1. A postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type requiring electrical power to maintain the contents thereof, said postal security device also comprising a battery powering the second memory and a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory is disconnected from the battery, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine, said body of data encrypted by the cryptographic engine with respect to the encryption key.

2. A method for use with a postal security device comprising a secure housing, and within the secure housing a body of data having a size, said postal security device also having within the secure housing means for generating print data for printing of postage indicia, said generating of said print data relying in part on the body of data, said postal security device also having within the secure housing a first memory sized to accommodate the body of data, said first memory of a type not requiring electrical power to maintain the contents thereof, said postal security device also having within the secure housing a second memory not large enough to accommodate the body of data, said second memory of a type that requires electric power to maintain its contents, said postal security device also comprising a battery powering the second memory and a tamper switch mechanically coupled with the secure housing so that upon tampering with the secure housing the second memory is disconnected from the battery, said postal security device further comprising an encryption key stored within said second memory, said postal security device further comprising a cryptographic engine; the method comprising the steps of:

storing the encryption key within the second memory;

encrypting the body of data by the cryptographic engine with respect to the encryption key;

storing the encrypted body of data in the first memory; and

in the event of tampering, removing power from the second memory.

- 5 3. A method for use with a postal security device comprising a secure housing, and within
the secure housing a body of data having a size, said postal security device also having within
the secure housing means for generating print data for printing of postage indicia, said
generating of said print data relying in part on the body of data, said postal security device
also having within the secure housing a first memory sized to accommodate the body of data,
10 said first memory of a type not requiring electrical power to maintain the contents thereof,
said postal security device also having within the secure housing a second memory not large
enough to accommodate the body of data, said second memory of a type that clears its
contents upon a predetermined electrical condition, said postal security device also
comprising a tamper switch mechanically coupled with the secure housing so that upon
15 tampering with the secure housing the second memory has said predetermined electrical
condition, said postal security device further comprising an encryption key stored within said
second memory, said postal security device further comprising a cryptographic engine; the
method comprising the steps of:

storing the encryption key within the second memory;

- 20 encrypting the body of data by the cryptographic engine with respect to the encryption key;

storing the encrypted body of data in the first memory; and

in the event of tampering, causing said predetermined electrical condition.

1/1

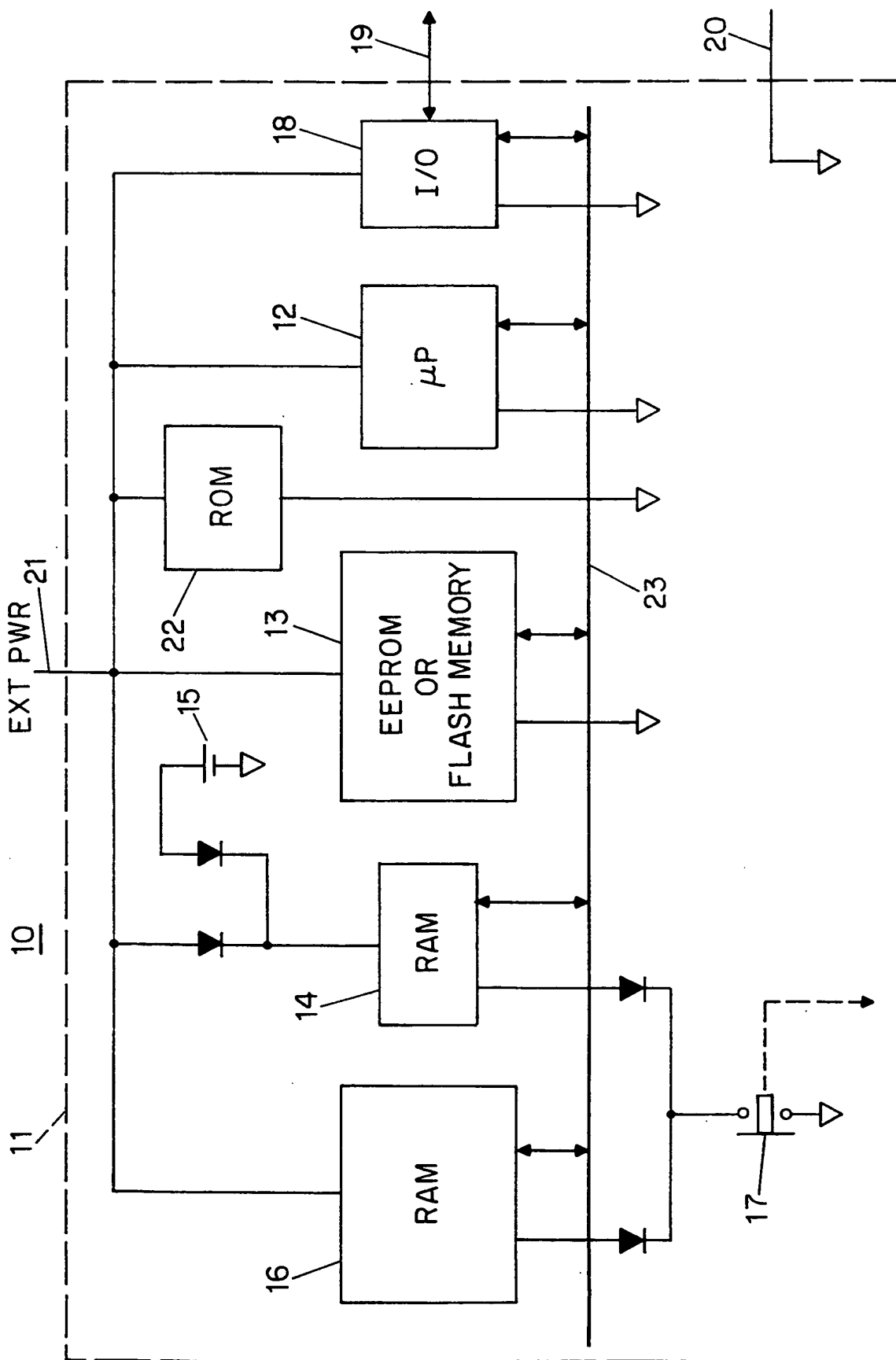


FIG. 1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/05891

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G07B 17/04

US CL : 705/405

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 380/3, 4, 23, 25; 705/401, 405, 410

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NoneElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
None

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,575,621 A (DREIFUS) 11 March 1986, see abstract.	1-3
A	US 4,882,752 A (LINDMAN et al) 21 November 1989, see abstract.	1-3
A	US 5,097,253 A (ESCHBACH et al 17 March 1992, see abstract.	1-3
A	US 5,249,227 A (BERGUM et al) 28 September 1993, see abstract.	1-3

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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Date of the actual completion of the international search

15 MAY 1999

Date of mailing of the international search report

28 MAY 1999

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Authorized officer

EDWARD R COSIMANO

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REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

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International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum)

ASCOP061W0

Box No. I TITLE OF INVENTION

TAMPER RESISTANT POSTAL SECURITY DEVICE WITH LONG BATTERY LIFE

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

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United States of America

☐ This person is also inventor.

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Facsimile No.

(203) 926-0203

Teleprinter No.

State (that is, country) of nationality: US

State (that is, country) of residence: US

This person is applicant
for the purposes of:all designated
Statesall designated States except
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Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

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United States of America

This person is:

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is marked, do not fill in below.)

State (that is, country) of nationality: US

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This person is applicant
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agent



common representative

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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

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Assistant Commissioner for Patents
United States Patent and Trademark
Office
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Washington, D.C.20231
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27 January 2000 (27.01.00)

International application No.

PCT/US99/05891

Applicant's or agent's file reference

ASCOP061WO

International filing date (day/month/year)

18 March 1999 (18.03.99)

Priority date (day/month/year)

18 March 1998 (18.03.98)

Applicant

NACLERIO, Edward, J.

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

16 July 1999 (16.07.99)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

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Diana Nissen

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